

REMARKS

Reconsideration of the application as amended is respectfully requested, especially in view of the following remarks:

The objections:

The examiner's objection to the drawings has been overcome by amending the drawings to include sheet numbers. While 37 C.F.R. 1.84(t) only states that drawings should, not must, have sheet numbers, the changes have been made to advance the application towards issuance.

The examiner's objection to claims 1 and 5 has been overcome by making the amendment suggested by examiner. Specifically, in line 1 of claims 1 and 5, "the thermal protection tile system" has been changed to "a thermal protection tile system".

The 103 rejection:

Claims 1-7 were rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson, et al. in view of Laska. The examiner states that Richardson shows multiple resistors(110,112) of known resistance extending between each of the at least one pair of electrical conductors... This is, in fact, not the case. A closer inspection of Richardson reveals that Richardson shows his resistors extending in line with, or in series with, each of his conductors. Nowhere in the Richardson patent is it contemplated having resistors extending between the conductors. This is a crucial distinction of applicant's invention over that of Richardson. The resistors must extend between the conductors, forming a

parallel circuit, as opposed to Richardson where the resistors extend in line with his conductors, forming a series circuit. In fact, the Richardson patent is not relevant to the present invention for other reasons. Most importantly, the Richardson patent does not ever contemplate the monitoring of a loss of structural integrity, but instead monitors a potential loss of structural integrity. This is an important distinction. In Richardson, the resistors act merely as strain gauges, wherein an increase in resistance in his circuit indicates an increase in strain in the structure. If the structure in Richardson were to continue to strain until structural integrity were lost, his device would cease to function. If his circuit were broken by a structural loss of integrity, his transmitter 102 would no longer be able to send an electrical signal to receiver 108. This is not the case in the present invention where, by having a parallel circuit, resistance measurements would continue to be taken even after the circuit was broken, due to the nature of operation of a parallel circuit. Richardson does not contemplate his circuit being broken, only being strained. Therefore, it would not be obvious to modify Richardson to provide display means as taught by Laska. Or more appropriately, adding display means to Richardson, as taught by Laska, does not overcome the deficiencies of Richardson, as discussed above.

Claims 1 and 5 have been amended to more specifically state that the multiple resistors of known resistance also have a known location, and extend between each "one" of said at least one pair of electrical conductors. This amendment should make it clear that the circuit of the present invent is a parallel type circuit, in contrast to the series type circuit of Richardson.

With regard to the patent to Laska, Laska shows a device for monitoring the integrity of an aircraft structure which does measure the resistance of a parallel circuit to detect the

location of damage by the amount of resistance change in the circuit. However, the crux of the present invention is that the specific location of the loss of integrity can be determined by monitoring the resistance at both ends of a parallel circuit, and by comparing the readings at both ends, the specific "extent" of the damage can be determined. Laska does not contemplate this idea. He only takes readings at one end, which tells him the location of the structural failure, but not the specific "extent" of the failure. This can only be done by comparatively monitoring both ends of the electrical circuit, as the present invention sets forth. Thus, Laska does not contemplate the present invention, either taken alone, or in combination with Richardson. The present invention is the only one that can determine "extent" of damage, due to its unique idea of comparing resistance at both ends of a parallel circuit.

Claims 1 and 5 have been amended to include the limitation of claims 4 and 7, respectively, wherein the measuring means is connected to two ends of the pair of electrical conductors. Claim 1 has been further amended to state that the computing means continually monitors the resistance in said at least one pair of electrical conductors in real time, "alternately at each end of said two ends of said at least one pair of electrical conductors". This allows a determination of both location and extent of loss of tile integrity, in contrast to Laska.

New claim 8 has been added. Claim 8 is essentially claim 1, without the limitation that the device is for monitoring the integrity of a thermal protection tile system on a space craft. It is believed that the specification supports this new claim, that the spacecraft limitation is only the preferred embodiment and more general uses are envisioned.

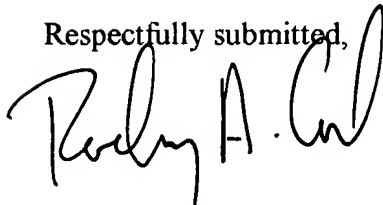
Spelling errors have also been corrected by amendment to claims 1, 3 and 5.

Claim 4 has been canceled since its limitations were added to claim 1, and part of claim 7 was deleted as this limitation was added to claim 5.

Conclusion:

For the foregoing reasons, it is believed that the objections of the examiner have been overcome by the attached amendments to the drawings and to claims 1 and 5. It is also believed that the rejection to claims 1-7 under 35 U.S.C. 103 has been overcome by a combination of amendments to these claims, and the arguments set forth above. It is respectfully requested that the objections and rejection be withdrawn, and that the application, including claims 1-3 and 5-8, be allowed to issue as a patent.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Rodney A. Corl". The signature is stylized with a large, looped "R" and a cursive "Corl".

Rodney A. Corl

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